FEB 4 1943

STATISTICAL BULLETIN

METROPOLITAN LIFE INSURANCE COMPANY

VOLUME 23 OCTOBER · 1942 NUMBER 10

Mortality Report for the First Nine Months of 1942

AT THE end of the third quarter of 1942, the health record of the people of the United States and Canada is better than ever. This is indicated by the year-to-date death rate for the many millions of Industrial policyholders of the Metropolitan Life Insurance Company, which is only 7.4 per 1,000, or 2.8 percent below the previous minimum recorded at this time last year.

Looking ahead at the beginning of the year, it was feared that certain diseases and conditions, such as the principal communicable diseases, the respiratory conditions, and the deaths from accidental causes, might be so adversely affected by the war effort as to cause a rise in the mortality rate for the year. Actually only one of these, the accident situation, has made a poor showing.

Influenza and pneumonia, which caused such havoc at the time of the last war, both record new low rates for this period of the year. The combined figure for the two, 33.9 per 100,000, is little more than one quarter of the rate for 1917. The ability to control these two diseases has, of course, greatly improved in the intervening years. For although the cause of influenza still remains unknown, and effective means of prevention are not yet available, pneumonia, so often the terminal condition of influenza in the past, is now well controlled by the use of serum and the sulfa drugs.

For tuberculosis the record is also excellent—the present minimum rate of 42.1 per 100,000 is less than one quarter of the mortality from this disease during the period of the last war. Moreover, the decline in the tuberculosis death rate has been greater in the past year than in the years immediately preceding. This situation is particularly gratifying, because it seemed that we might in these critical war days be faced with an arrest or even a reversal of the downward trend of the mortality. In England, although the conditions are better there than in the occupied countries of Europe, the increase in deaths from tuberculosis in 1941 was 11.8 percent over 1939. For France, the mortality from pulmonary tuberculosis in the first six months of 1941 was 20.4 percent above that of the first six months of 1939. Con-

sidering the marked increase in the incidence of the virulent, rapidly developing type of tuberculosis, the mortality for 1942 is undoubtedly still more unfavorable. The situation in the United States is quite different. We have not, as yet, suffered any food shortage, and the housing shortage has been limited to the defense areas. Nevertheless, it is necessary for us to be aware of the dangers which may yet arise from the overcrowding in the defense areas and from the scarcity of physicians as well as the depletion of hospital staffs in all grades, arising from the absorption of the personnel in the Army and in war work.

A group of conditions which might have been adversely affected by the war are the four principal communicable diseases of childhood. However, scarlet fever, whooping cough, and diphtheria have each continued to record minimum rates, so far, this year. These, together with measles, account for less than three deaths per 100,000. At the time of the first World War, these diseases caused about 18 times this number of fatalities.

Accidents alone have reacted unfavorably. The accident rate is up from 50.7 in 1941 to 51.3 per 100,000, or 1.2 percent. This, too, despite the fact that motor vehicle accidents, which normally account for about one third of the total, are down about 15 percent. As home accidents are up very little, the increase has occurred largely in the industrial accidents and in accidents in public places. The increase in industrial employment—perhaps 2,000,000 since Pearl Harbor, and 6,000,000 since the fall of France—has had its effects, especially since some of the persons entering the defense industries were inexperienced and, in the beginning, poorly trained. Also, the pressure for production of needed war materials may have caused some relaxation in safety precautions. The accidental deaths among the military personnel in training have also contributed to the total rise in the accident rate for the year.

Suicides, on which a more detailed report was made last month, in September again recorded a low rate, and the year-to-date figure remains, with one exception, the lowest on record since the last war.

War conditions also affect the control of venereal disease, but any increase in prevalence is not immediately reflected in mortality statistics. Thus the decline in the death rate from syphilis in the first nine months of 1942, as compared with 1941, is a reflection of conditions in prior years. Fortunately, the country is much more aware of the dangers of syphilis than it was at the beginning of the first World War, and is also in a much better position to prevent the spread of the disease. To this effect much work has been done by Public Health Departments in tracing contacts and enforcing their treatment. Also, there has been further development both in the manufacture of the specific drugs and in the methods of treatment. Investigations now in progress bear promise of greatly accelerated cures.

Another item worthy of notice in this year's record is the continuation of the downward trend in the death rate for the puerperal causes, despite the sharp rise in the birth rate. The extent of the improvement in maternal mortality since the period of the last war can only be appreciated by comparing the present puerperal death rate with that in 1916 and 1917. In those years the figure for the Metropolitan Industrial Department was approximately 18 maternal deaths per 100,000 policyholders, or four times that of today. Of course, the birth rate in the general population was higher then—25 as compared with about 20 now—but not enough to account for the difference in mortality. This decline in maternal mortality has been the result, largely, of the improvement in obstetrical care, and one can only hope that the shortage of qualified medical personnel during this time of national emergency will not occasion a setback.

Finally, the total mortality in 1942 has been aided materially by the record made by the diseases of middle and later life, which account for approximately three fifths of the deaths of all ages. In the recent past, these causes have shown some tendency to increase but in 1942 only one, namely, diseases of the coronary arteries, is up, while cancer and diabetes have remained at approximately the same level as in 1941, and cerebral hemorrhage, chronic heart disease, and chronic nephritis have declined. This favorable situation in an important group of diseases has contributed materially to the improvement in the mortality record for the year.

The Sex Ratio in Our Population Since 1850

In a country not seriously affected by migration, the males and females are usually not far from equal in number. This is the net consequence of two factors acting in opposite directions; on the one hand, there are ordinarily about 105 male births to every 100 females; on the other hand, the males are subject to a higher death rate. However, the mass movement of population into the United States and the westward drift across the continent during the last hundred years have produced striking variations in the ratio of males to females in various areas. Since men are more likely to migrate than women, it is found, first, that the ratio of males to females in the United States rises after a period of heavy immigration, only to fall after it is curtailed. Secondly, as a result of the steady movement of the population across the country, the ratio of males to females increases in proceeding from east to west. The table on page 4 shows the ratio of males to females in broad longitudinal divisions of the United States from 1850 to 1940, and the map on page 5 portrays the situation graphically.

According to the census of 1940, there were 1,007 males for every

1,000 females in the United States, this ratio being the lowest since the peak of 1,060 in 1910. During the interim, immigration into the country was on the decline, from 5,700,000 in the decade 1911-1920 to 4,100,000 in 1921-1930, and then to little more than half a million in the decade 1931-1940. The decade prior to the peak ratio of 1,060 in 1910 witnessed the greatest voluntary movement of population the world has probably ever seen, the immigrants during those years numbering 8,800,000. Similar correspondence between fluctuations in the numbers of immigrants and changes in the sex ratio is found for the five decades from 1850 to 1899. The fall in the ratio of males to females in the decade from 1860 to 1870, which included our Civil War, was particularly severe, the figure dropping from 1,047 to 1,022 per 1,000 females. This drop was the result, not only of curtailed immigration over the decade, but also of the loss of at least 400,000 men on both sides of the conflict by military action or by disease during the war; these men were 2½ percent of the male population of 1860.

With a sex ratio for the United States of 1,007 to 1,000 recorded in the census of 1940—that is, an excess of only 450,000 males—the outlook is that a protraction of the present war, with casualties as heavy as those of the Civil War, may cause a preponderance of females.

The census at each decade from 1850 to 1940 shows a rise in the ratio of males to females as one goes from the Eastern States to the East Central, and then, in turn, to the West Central and Western States. In the early days when travel was rather difficult, the contrast between the Eastern States and Western States was extreme. For example, in 1850, there were only 1,009 males per 1,000 females in the Eastern States, while in the West the ratio was as high as 2,789 to 1,000. Over

MALES PER 1,000 FEMALES IN THE TOTAL POPULATION OF THE UNITED STATES, ACCORDING TO BROAD GEOGRAPHIC DIVISIONS, FROM 1850 TO 1940

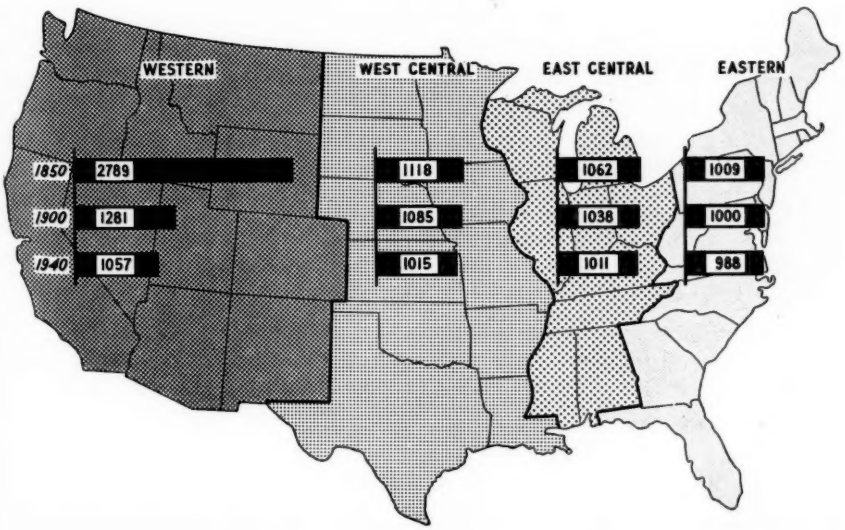
YEAR	TOTAL UNITED STATES	NEW ENGLAND, MIDDLE ATLANTIC, AND SOUTH ATLANTIC STATES	EAST NORTH CENTRAL AND EAST SOUTH CENTRAL STATES	WEST NORTH CENTRAL AND WEST SOUTH CENTRAL STATES	MOUNTAIN AND PACIFIC COAST STATES
1940	1,007	988	1,011	1,015	1,057
1930	1,025	999	1,030	1,038	1,095
1920	1,040	1,008	1,043	1,060	1,146
1910	1,060	1,019	1,047	1,087	1,289
1900	1,044	1,000	1,038	1,085	1,281
1890	1,050	995	1,042	1,099	1,419
1880	1,036	976	1,036	1,106	1,534
1870	1,022	972	1,030	1,092	1,597
1860	1,047	993	1,064	1,116	2,135
1850	1,043	1,009	1,062	1,118	2,789

the years from 1850 to 1940, the sex ratio for the Eastern States was not far from unity for most of the time; indeed, in six out of the ten census dates, including the last two, the number of females was in excess of males. In the Western States the ratio dropped rapidly as the country developed, but in 1940 there was still a moderate excess, 1,057 males per 1,000 females.

The movement of population from East to West has not only raised the ratio of males to females at the points of arrival, but has also depressed the ratio at the points from which the migrants originate. In fact, if it were not for the tendency for the foreign born to settle principally in the Eastern States of the country, the deficiency of males noted in 1940 for this area would have been even greater. Thus, among the native born in the Eastern States, there were only 979 males per 1,000 females in place of the ratio of 988 to 1,000 for the total population in that area.

The situation so far described carries us up to 1940, the date of the last census. Since then, there have been important changes arising from the war conditions. Many areas have suffered a loss of population to newly expanding industrial centers. All areas have undergone a withdrawal of men for military service. What the future will bring in the

MALES PER 1,000 FEMALES IN THE UNITED STATES ACCORDING TO BROAD GEOGRAPHIC DIVISIONS 1850, 1900, 1940



distribution of men and women within the country is very uncertain, for so much depends upon the needs of the Army for men and the demands of our war industries for workers. In any event, the outlook is that our postwar society may be constituted of practically equal numbers of men and women, and without such marked variations in different parts of the country as were found in the past.

Ideal Weights for Women

INTEREST in body weight is perennial, particularly among women, for esthetic reasons as well as for reasons of health. There is an added interest in weight today in the light of modern developments in the science of nutrition. The wartime need to use food wisely supplies an added incentive to avoid overweight, as judged by an appropriate standard of height and weight. Such a standard is not necessarily furnished by mere averages.

Tables in current use of average weights for women show sizable increases with advancing age. Thus between ages 30 and 50 the average weights for short women increase by 13 to 14 pounds, or more than 10 percent, and those for tall women, 15 pounds or more. Such increases are neither necessary nor desirable. They largely reflect the effect of persisting in the habit of consuming the same amount of food while physical activity decreases.

All in all, longevity is probably the best single index of "ideal" weight. A large-scale study by the Metropolitan Life Insurance Company has shown definitely that at the young adult ages a moderate degree of overweight was beneficial, but that beginning at about age 35, the advantage lay with women of average weight. In middle age and beyond, the underweights had the best longevity record. Frank obesity was bad at every age. Even in young people, the advantage of a moderate degree of overweight has been diminishing, because two important diseases—tuberculosis and pneumonia—which have largely accounted for the excess mortality among young underweights in the past, have been brought under control. Indeed, the advantage of overweight at the younger ages is so temporary that if the whole life span is considered, a moderate degree of overweight even at those ages is probably not desirable, because it often indicates a tendency to overeat, which is the basis of much of the preventable obesity of later life.

The dangers of overweight, particularly of definite obesity, are so many and so serious that women with a tendency to overweight should bear them well in mind. Stout people are more likely to develop serious chronic disease, and to do so at an earlier age than persons of lighter weight. Thus, hardening of the arteries and high blood pressure are more common among young and middle-aged overweights

than among underweights of the same age. Consequently, the mortality from chronic diseases of the heart, kidneys, and blood vessels, which account for a majority of the deaths in adult life, is high in overweight persons, and increases with the degree of overweight. Overweight women particularly are susceptible to diabetes and to gall bladder disease. They seem to be less resistant to infections, and for that reason probably are poorer surgical risks. The hazards of maternity seem to be greater for stout women. Finally, such women comprise more victims of certain types of arthritis, apparently because the weight-bearing joints eventually suffer from overstrain and break down.

Actually, there is no one set of weights that can be called "ideal" and to which all women of a given height should conform. For there are many factors influencing body weight which must be considered in deciding what is the best weight for a particular individual or type. Thus, one would expect a small-boned woman with small chest girth and hip width to weigh less than a woman of the same height in whom these other dimensions are greater. Length of the trunk in relation to the total height is another factor in the variations in body weight.

For adults, irrespective of age, the most favorable weights for health and longevity are probably close to the averages observed at ages 25 to 30. As already indicated, however, a table of best or "ideal" weights must take into account the variations in the body structure. A suggested table of this kind, applicable to women past age 25, is shown on page 8. This table gives range of "ideal" weight for three separate groups of women, for those of slight and heavy frame, as well as those of medium build.

Overweight is so common an impairment that it constitutes a national health problem of the first order. There is good reason to believe that control of this problem would result in a substantial increase in health and longevity of adults, particularly after middle age, a period of life in which mortality rates have been most resistant to change. In this way the onset and course of chronic disease would be delayed for large numbers of people. How control of overweight is effective can be shown in a number of ways. For example, overweights with high blood pressure often get relief merely by reduction in weight. Another striking example curiously enough is connected with war. In some countries which have experienced severe limitation of food supplies, in this war as well as in the last, the death rates from diabetes and other chronic diseases associated with overweight have declined. This is probably one of the factors in the favorable health situation which has been noted in wartime England.

American women today are far more weight-conscious than were their mothers and grandmothers. But this weight-consciousness is

futile unless it leads to sensible action. It is no advantage to reduce if, in the process, the individual ruins her health and efficiency. A sensible and effective program of weight reduction involves first, persistency; second, gradual reduction; and third, the use of a proper diet. Such a diet is well rounded: it contains correct proportions of carbohydrates, proteins, and fats, and is rich in vitamins and minerals. There is hardly any article of the ordinary diet, even potatoes and bread, which need be wholly eliminated from a reducing diet. Such a diet usually needs no supplementation by vitamin preparations if it is properly constituted. Only in exceptional cases and under medical advice and direction should any type of medication be used. Fortunately, wartime rationing of foods will not interfere with sensible reduction programs. Indeed, it may actually bring definite advantages.

PROPOSED RANGE OF "IDEAL" WEIGHTS FOR WOMEN. AGES 25 AND OVER

HEIGHT (WITH SHOES)		WEIGHT IN POUNDS (AS ORDINARILY DRESSED)		
		Small Frame	Medium Frame	Large Frame
Feet	Inches			
5	0	105–113	112–120	119–129
	1	107–115	114–122	121–131
	2	110–118	117–125	124–135
	3	113–121	120–128	127–138
	4	116–125	124–132	131–142
	5	119–128	127–135	133–145
	6	123–132	130–140	138–150
	7	126–136	134–144	142–154
	8	129–139	137–147	145–158
	9	133–143	141–151	149–162
	10	136–147	145–155	152–166
	11	139–150	148–158	155–169
6	0	141–153	151–163	160–174

The Problem of Syphilis

FEW diseases whose cause is known and whose prevention and cure are possible have been as hard to control as syphilis. The situation has been complicated, of course, by the social factors involved and by the stigma that was attached to the disease. The current campaign attempts to secure for syphilis the same treatment as for other public health problems. This new and more objective approach should eventually prove highly successful.

One difficulty in the syphilis campaign has been the lack of accurate data on the prevalence of the disease. Case reporting has been unsatisfactory in many areas. While serological surveys have yielded considerable information for special groups, general mortality figures have continued to be, up to now,

the best index of the prevalence of syphilis in all parts of the country. Mortality is, however, a rather unsatisfactory measure. In the first place, there is still a tendency to conceal syphilis as a cause of death. Moreover, this tendency is not consistent but differs from place to place. The deaths from syphilis do not indicate the number of cases where treatment was instigated promptly and cure effected, nor the cases where cure occurred spontaneously. That this item is of some importance has been demonstrated in recent work. It now appears that spontaneous cures are more common than was formerly realized.

The recent publication of the results of the serological blood tests for syphilis on the first million Selective Service registrants does add considerably to our knowledge, for it furnishes information on young men from every State of the Union. Furthermore, the prevalence of syphilis in this group is a fairly reliable index of the situation in the general population. An added advantage to be derived from the new figures is the opportunity given to compare the results based on blood tests with those from death rates.

But before examining the degree of correlation between the results of the serological blood tests and the published mortality, it may be well to review some of the characteristics of the disease. In general, syphilis is a disease in which mortality increases with age. The outstanding exception occurs at the earliest years of life, when congenital syphilis has a death rate approximately as high as that recorded for adults in their 30's. Aside from this, however, the age curve shows a general upward trend throughout most of life. The mortality is low among children and adolescents, but rises sharply in early adult life and continues to increase until middle age. It then levels off and decreases only at the most advanced ages.

The shape of the age curves is similar for both color and sex groups, although the levels differ markedly. Colored persons record an all-age rate over 6½ times as high as white persons, while males register rates about two times as high as females. The death rates by age show that while the rates are much higher for the colored at every age period, the excess mortality for the males is largely confined to the adult ages. In fact, females from ages 15 to 24 actually record higher mortality from syphilis than do males.

The difference in syphilis mortality between the white and the colored races is more marked today than it was at the time of the last war. In the years 1917 to 1940 inclusive, the adjusted death rate from syphilis for the white persons, ages 1 to 74, in the Industrial Department of the Metropolitan Life Insurance Company has shown an average annual *decrease* of 3.9 percent at the same time that the adjusted rate for the same age group of colored policyholders has *increased* about ½ of 1 percent per year. That is, the adjusted death rate in the first five years of the period was 14.0

per 100,000 for white policyholders as compared with a rate of 34.0 for colored. In the last five years the figures for the two groups were 7.0 and 37.2 per 100,000, respectively. Just how much the trend in death rates has been affected by the change in attitude toward the disease during the period is difficult to say. The concentrated effort of many agencies to secure adequate and more accurate reporting has probably had a good effect. That the recorded figures are still somewhat understated is generally recognized.

The geographic distribution of the mortality from syphilis shows a fairly clear-cut and instructive picture. Higher rates are recorded in the Southern States than in the Northern, and the lowest rates of all are recorded in the Rocky Mountain State of Utah and the Middle Western States of North and South Dakota. The geographic distribution is not, of course, the result of difference in climate but of differences in the color, sex, and age composition of the populations of the various States, of the proportion living in urban areas, the general level of the health work in the community, and other factors.

Essentially the same distribution is shown by the results of the serological tests among selectees and volunteers for service in the armed forces of the country. In other words, the correlation between the recorded mortality and the serological tests is of a high order when all States are considered. When the data are considered separately for the Northern and Southern States, it is found that the relationship is much clearer for the States with the predominantly white population. That is, the coefficient of correlation between mortality and serological tests, or the numerical measure of the association where 1.00 would indicate complete agreement, is 0.76 ± 0.06 for the United States as a whole, 0.81 ± 0.06 for the Northern States, and 0.63 ± 0.15 for the Southern States. The mortality figures appear to be less reliable as an index of the prevalence of syphilis when the population includes a large proportion of colored. It is difficult to say whether this results from the incomplete reporting of causes of death in the Southern States, or from the larger proportion of spontaneous cures in that area. In any case, even in the Southern States, the relationship between mortality and serological tests is close enough to warrant the use of death rates, in the absence of more reliable data, as an indication of the prevalence of syphilis.

The absence of accurate data on the prevalence of syphilis has heretofore handicapped the campaign against the disease. Now that these data are being accumulated through the serological tests on large numbers of the population, it is to be hoped that public opinion will be fully aroused to the need for the control of syphilis and that real progress will now be made toward its ultimate elimination.

Comparative Data on the Causes of Death Among Industrial Policyholders

The following table shows the mortality among Industrial policyholders for September 1942 and September 1941, together with the death rates for the first nine months of 1942, 1941, and 1940.

DEATH RATES* PER 100,000 POLICYHOLDERS FROM SELECTED CAUSES. WEEKLY PREMIUM-PAYING INDUSTRIAL BUSINESS — METROPOLITAN LIFE INSURANCE COMPANY

CAUSES OF DEATH	ANNUAL RATE PER 100,000 POLICYHOLDERS*				
	September 1942	September 1941	Year to Date: End of September		
			1942	1941	1940
ALL CAUSES—TOTAL	653.6	651.3	737.6	759.1	771.2
Typhoid fever	0.4	0.1	0.3	0.4	0.6
Measles	—	.1	.6	1.0	.4
Scarlet fever	.3	.2	.4	.5	.6
Whooping cough	1.3	1.1	1.0	1.3	1.2
Diphtheria	.8	.8	.5	.6	.8
Influenza	1.0	1.4	4.3	9.1	8.6
Pneumonia (all forms)	18.1	16.8	29.6	33.2	38.0
Tuberculosis (all forms)	37.2	38.4	42.1	43.8	45.1
Tuberculosis of respiratory system	33.8	35.4	37.9	40.0	40.7
Syphilis	9.1	10.3	10.7	11.4	11.6
Cancer (all forms)	96.6	98.5	103.9	104.0	102.3
Diabetes mellitus	22.7	20.7	27.8	27.8	29.2
Cerebral hemorrhage	53.6	53.5	60.2	61.2	61.3
Diseases of the coronary arteries and angina pectoris	50.2	44.1	56.8	54.0	51.9
Other chronic heart diseases†	131.7	125.3	155.8	157.3	160.2
Diarrhea and enteritis	6.5	8.2	4.2	4.4	4.3
Appendicitis	6.0	7.1	5.9	7.7	9.3
Chronic nephritis	40.4	40.1	49.6	52.0	56.9
Puerperal state—total	4.3	4.4	4.4	4.7	4.8
Suicides	5.4	6.6	7.2	7.3	8.3
Homicides	4.0	3.4	3.7	3.6	3.7
Accidents—total	45.5	51.6	51.3	50.7	46.3
Home accidents	8.5	7.5	11.3	11.0	11.7
Motor vehicle accidents	14.3	22.0	17.2	20.2	16.8
War deaths	4.3	.1	4.1	.1	.1
All other causes of death	114.2	118.5	113.3	123.0	125.6

*The rates for 1942 are subject to slight correction, since they are based on provisional estimates of lives exposed to risk.

†International List (1940) titles 92, 93 (c), (d), (e), and 95.

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Cancer (all forms)	96.6	98.5	103.9	104.0	102.3
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Chronic nephritis	40.4	40.1	49.6	52.0	56.9
Puerperal state—total	4.3	4.4	4.4	4.7	4.8
Suicides	5.4	6.6	7.2	7.3	8.3
Homicides	4.0	3.4	3.7	3.6	3.7
Accidents—total	45.5	51.6	51.3	50.7	46.3
Home accidents	8.5	7.5	11.3	11.0	11.7
Motor vehicle accidents	14.3	22.0	17.2	20.2	16.8
War deaths	4.3	.1	4.1	.1	.1
All other causes of death	114.2	118.5	113.3	123.0	125.6

*The rates for 1942 are subject to slight correction, since they are based on provisional estimates of lives exposed to risk.

†International List (1940) titles 92, 93 (c), (d), (e), and 95.

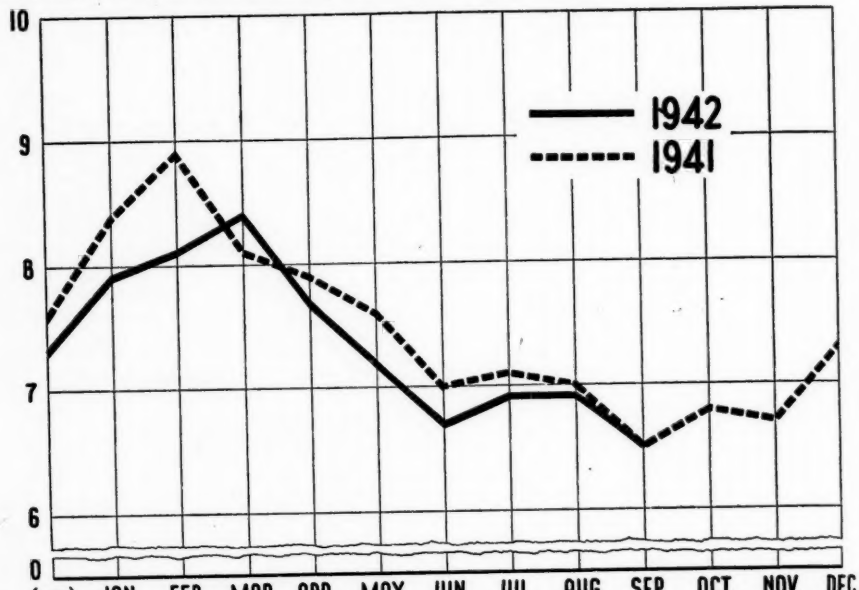
Correspondence on the subjects discussed in these BULLETINS may be addressed to: The Editor,

STATISTICAL BULLETIN
Metropolitan Life Insurance Company
1 Madison Avenue, New York, N. Y.

MORTALITY FROM ALL CAUSES

METROPOLITAN LIFE INSURANCE COMPANY
INDUSTRIAL DEPARTMENT, WEEKLY PREMIUM-PAYING BUSINESS

DEATH RATES PER 1,000 · ANNUAL BASIS (*1942 figures are provisional*)



(DEC.)	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.
1941	8.3	8.8	8.1	7.9	7.6	7.0	7.1	7.0	6.5	6.8	6.7	7.3
1942	7.9	8.1	8.4	7.7	7.2	6.7	6.9	6.9	6.5			

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